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ABSTRACT

Oversight information systems provide data to oversight agency managers that enable them to: (1) monitor the operations of agencies for which they are charged oversight responsibilities; (2) compare performance data against set performance criteria; and (3) identify exceptions that occur outside performance tolerance parameters. This research study examined computerized oversight information systems in the Office of Management and Budget (OMB) and the General Accounting Office (GAO) of the federal government to determine how system capabilities affect user expectations, what constraints impede a system's use by primary users, and what factors appear to enhance the evolution of effective oversight information systems. Six systems were examined through structured interviews with primary users and/or systems designers and by reviewing input and output documents. Findings indicate that information provided by these systems tends to be used primarily: (1) for upward and outward accountability; (2) to support internal strategic planning efforts; (3) to report to external groups, such as the U.S. Congress; and (4) to provide performance reports to oversight agencies' managers. These systems help an agency demonstrate that it is accomplishing goals, justify resources, and develop data to support policy initiatives. They enhance internal accountability in the oversight agencies, but not in the overseen agencies, and oversight agency managers also utilize these systems to promote political accountability. (JHP)

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COMMAND AND CONTROL:

PUBLIC PROGRAM OVERSIGHT IN THE INFORMATION AGE

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COMMAND AND CONTROL:
PUBLIC PROGRAM OVERSIGHT IN THE INFORMATION AGE

OVERVIEW

The concept of oversight in governmental circles connotes control and power. Recent information technology advances combined with increased access to information technologies have enhanced the capacity of oversight agencies to exert their oversight role. The technology facilitates more rapid and more extensive information collection and transfer within large, complex agencies, and it extends the information flow across agencies and jurisdictions. This technological reach raises interesting questions about the political and organizational interaction involved in oversight relationships.

The information systems that have evolved in major oversight agencies offer capabilities to inform decision-makers, but the availability of the information may create expectations for expanded information flow to external actors. Oversight

information systems in some agencies have progressed from basically management information systems with transactional data to support routine reviews, to more sophisticated decision support systems that draw upon transactional data and available models to make projections and support policy analysis. In this sense, progress in information systems design and technical capabilities has opened opportunities for central oversight agency managers seeking information to support both routine and non-routine decision-making.

Oversight information systems are defined here as information systems that provide information to oversight agency managers to enable them to: monitor the operations of agencies for which they are charged oversight responsibilities; compare performance data against set performance criteria established by the oversight agency or by external political authorities; and identify exceptions outside of tolerance parameters (related to the performance criteria). The information provided may also assist oversight agency personnel in their internal planning and decision-making processes. Oversight information systems rely on data input by actors within the oversight reporting system, and data collection is primarily the responsibility of personnel in the agencies being overseen.

This study examines computerized oversight information systems in the Office of Management and Budget (OMB) and the General Accounting Office (GAO) in the federal government. Through structured interviews with users in these agencies, we address several questions about the dynamic relationship between the information systems and the exertion of political oversight. First, how do the system capabilities affect user expectations and the extent and type of use of the information systems for oversight? Second, what constraints impede use of these information systems by the three primary users within the oversight agencies - operational, senior, and political managers? And, third, what factors appear to enhance the evolution of effective oversight information systems?.

While this is exploratory research, it builds upon previous work focusing upon the use of management information systems.1 As Bozeman and Bretschneider have aptly pointed out, previous studies have focused almost entirely upon private sector organizations, and have tended to neglect environmental factors affecting MIS development.2 This study differs dramatically from other research in examining information systems developed and used in a political environment for an explicitly political purpose - political oversight. The relationship of central interest is that between the technologically supported oversight information systems and the type and level of oversight

exerted. Implications of this relationship should be of interest for the design of information systems for public management.3

SETTING OF THE RESEARCH

The Office of Management and Budget has expanded its oversight role in the federal government to an extraordinary degree due to executive orders starting in the Ford Administration, and the Paperwork Reduction Act of 1980. Executive orders enhancing OMB's role in supervising executive agency rule-making procedures have drawn attention to this relatively new, heavy political oversight role.4 In the Paperwork Reduction Act Congress gave OMB a larger role in overseeing management within the executive agencies. That Act stipulates that the executive agencies provide data for OMB to use in exerting its paperwork oversight role. These new roles augment OMB's traditional oversight role over the federal budget. There is no legitimate escape for the executive agencies from meeting reporting requirements. Little incentive exists for agencies to skirt the oversight mechanism or fail to cooperate with the President's central management oversight agency.

In contrast to OMB, the General Accounting Office, the central agency representing the legislative arm of the federal

government, goes to the agencies in a fact-finding mode upon specific requests made by Congressional committees. Once GAO studies are conducted in response to congressional requests, agencies are required by law, similar to the OMB paperwork report requirements, to provide information and respond to the GAO reports' recommendations. Since the responses ultimately go to congressional committees, typically those initiating the original requests for studies, the agencies are also compelled to be cooperative.

One would assume that OMB and GAO can be assured of consistent reporting from the overseen agencies since the former acts from within the Executive Office of the President, and the latter in its congressional support role. With accurate and consistent reporting, their oversight information systems should be capable of servicing the intrinsic and vital needs of oversight managers: internal planning, management reporting, and external information dissemination and analyses.

Both OMB and GAO offer intriguing opportunities to study oversight information systems. At OMB, varied information systems with a wide range of capabilities are used. These cover a continuum from fairly straightforward budgetary preparation and execution information systems to highly complex analytical systems used for purposes such as appropriations negotiations. At GAO, the primary oversight information systems support planning, and track report recommendations and the

accomplishments made by agencies in response to GAO recommendations. These systems vary in their capabilities and in factors such as age and development, the range of internal checks and balances built in for system integrity, the level of incentives for accurate data collection, and the extent of system responsiveness to users.

Four oversight information systems were studied at OMB: First, The Federal Outlay Monitoring System. This system is over 20 years old, utilizing the Budget Status System. Executive agencies and certain agencies send OMB reports on federal outlays for two purposes. One is the ongoing monitoring of spending, and the other is to help the Department of Treasury forecast daily cash operating balances and borrowing requirements. Agencies prepare an annual report showing monthly outlays and update them periodically. The agency estimates are then monitored against actual spending levels.
Second, The Central Computer-Based Budget Management System (CBMS). Developed in 1981, CBMS is a sophisticated analytical system developed to help OMB better defend the President's budget in congressional negotiations. CBMS is used to respond to political and senior management analytical decision support

requests, track and analyze congressional appropriations actions, capture fall budget formulation decisions, and track and analyze congressional negotiations, budget resolution and reconciliation activities.

Third, The President's Private Sector Survey on Cost Control (Grace Commission) Status Reporting System. This system reports on cost savings that have resulted or will result from implementation of the Grace Commission management improvement and cost control recommendations. Set up in 1984, the Status Reporting System captures the following information for the Management Report to Congress: the type of issue; the type of legislation required; the implementation schedule; and the savings information. It is a simple system designed for reporting versus analysis.

And Fourth, The Reports Management System (RMS). RMS was developed in early 1981 to support implementation of the Paperwork Reduction Act of 1980 and regulatory review efforts. OMB's Office of Information and Regulatory Affairs (OIRA) uses it to monitor agency collection of public information. Its primary products are progress reports on paperwork reduction, ticklers on due dates for OMB responses on agency requests for regulatory review or information collection approval, and management reports on staff work.

Two oversight information systems were studied at GAO:

Information Handling and Support Facility. This is the overall database used to track GAO recommendations issued in reports. The recommendations are pulled into a special file: GAO staff are supposed to review the recommendations and report on agency/department progress in acting in accordance with the recommendations every six months. The systems performs a report-gathering function, and the Office of Policy at GAO overviews the reports

The Planning System. The Planning System is a new initiative. Its objective is to support an intensive planning process in GAO. GAO leadership identify issue areas in which GAO will focus, and then projections are made regarding resource allocation. The system allows the planners to assess progress made by GAO investigations against multi-year issue objectives. Planning documents are used for input into the decision process, and monitoring of the plans is done through review of much of the information collected through their assignment tracking system, as well as other data sources.

METHODOLOGY

Six oversight information systems were examined through structured interviews with primary users and/or designers of the various systems, and by reviewing input and output documents. Managers interviewed were either mid- or upper-level career personnel, and they represented both management and administrative staff. Each interviewee was asked detailed questions on the following topics: 1) how the oversight system originated; 2) what decision-making process defined the users' informational needs; 3) how data is defined and collected for the existing system; 4) what products are generated; 5) who the primary internal and external users are; 6) how satisfied users are with the system performance; 7) how the system has affected oversight capabilities; and 8) how the system has affected those subject to oversight. Interviews were taped and the transcripts were analyzed to aggregate responses.

THE POLITICAL ENVIRONMENT SURROUNDING OVERSIGHT INFORMATION SYSTEMS

It has become almost a given that organizations should plan and design their information systems to support organizational missions and management capabilities. A management information

system, as defined by Walter J. Kennevan, is "an organized method of providing past, present, and projection information relating to internal operations and external intelligence. It supports the planning, control, and operational functions of an organization by furnishing uniform information in the proper time frame to assist the decision-making process".[5] Gordon B. Davis and Margrethe H. Olson define it as "an integrated, user-machine system for providing information to support operations, management, and decision-making functions in an organization."[6]

These definitions specify three different organizational functions which the information systems may serve: day-to-day operations, managing, and decision-making. However, these functions are basically internal to an organization and address internal influence. Those agencies with oversight responsibilities must have an external focus as well; they rely upon information collected from other agencies. Routine reporting procedures support day-to-day decision-making and control, but the same data support strategic planning and policy-making integral to the oversight role.

Oversight agencies operate in highly politicized environments where the information flow to and from the oversight bodies is of great import to the reporting agencies, the oversight agency, and a variety of other stakeholders. FIGURE 1 graphically displays the variety of stakeholders involved in the oversight information system. The interplay of oversight actors inside the oversight agency and external to it can be analyzed by breaking down the oversight information process into discrete steps in the transfer of information between these actors.

Information needs determination is, of course, crucial to the oversight agency. Accurate and timely data that corresponds to performance criteria set by legislative and executive actors are essential to the oversight agency in fulfilling its mission. The discretion that legislative bodies typically leave to agencies in implementing programs is operative here, as in other policy areas.

Oversight agency managers must create a variety of decision rules regarding just how accurate and how timely the data provided from agencies under their purview is. The manner in which data are collected and transferred between agencies reflects the decision rules set by the oversight agency as well as more subtle cues that are transmitted to the collection agents from the oversight managers.

For example, the GAO project directors are directed to gather up-to-date data regarding the progress made by agencies in accordance with GAO recommendations. The burden for reporting field level progress lays with those managers out in the field. Personnel actions and bonuses have never been tied to failure or successes in such reporting, so the incentive for spending time in gathering up-to-date information from the agencies is not operative unless there were high projected cost savings that the GAO might then claim.

Data processing and information creation are not routine steps in the oversight process, since important interactions exist among a variety of actors. The conversion from management information systems to decision-support systems that support non-routine decision-making is highly dependent upon the success of the symbiotic relationships forged between the decision-maker/users and the information technologies, i.e., the processing and analytic technologies.[7]

Systems designers and system maintenance staff are key actors involved with the oversight managers in assuring the

information systems create the most useful information to achieve oversight objectives. The whole notion of information dissemination in the oversight process is especially interesting, for there are many actors involved in receiving outputs from the oversight information system.

Within the oversight agency, the operational managers depend upon the oversight information system quite regularly as they interact with the agencies that they oversee. Senior and political oversight agency managers receive aggregated reports using the oversight information system data, and rely upon the value of this information when they negotiate with other agencies, or legislative actors.

Interested parties outside of the oversight agency also routinely receive information generated from oversight information systems. These include congressional committees, or those which have vested interests in overseeing the oversight agencies, e.g., agencies which have been audited by the GAO or that have submitted information collection requests to OMB for clearance. In effect, this means that there are many users of the information generated from the oversight systems. However, the users most directly involved in designing the systems and revising the data needs and system capabilities are those first

order users within the oversight agency -- the managers at all organizational levels.

As noted above, the relationship of primary interest here is that between the oversight information systems and the character of political oversight. Summarized in FIGURE 1, we anticipated both primary and secondary, or longer-term, consequences of the dynamic interplay among actors involved in different steps in the information transfer process. We anticipated observing primary effects upon the extent of involvement of oversight agency managers in the oversight process, these actors' identification of information needs to support their oversight activities, and the allocation of resources within the agency. The oversight information system use and products could affect all three. Secondarily, we expected the system to affect the expectations of external and internal users, the strategic use of the systems, and the organization itself, e.g., its structure, staffing, and procedural routines.

We hoped to discern if and how relationships between the OMB and GAO and the agencies and staff from which they collected data were constrained or changed by the availability and use of the information systems. We hoped to discover effects upon interactions among the various actors involved in the oversight process and in the resource allocation process connected with

THE OVERSIGHT INFORMATION SYSTEM ENVIRONMENT

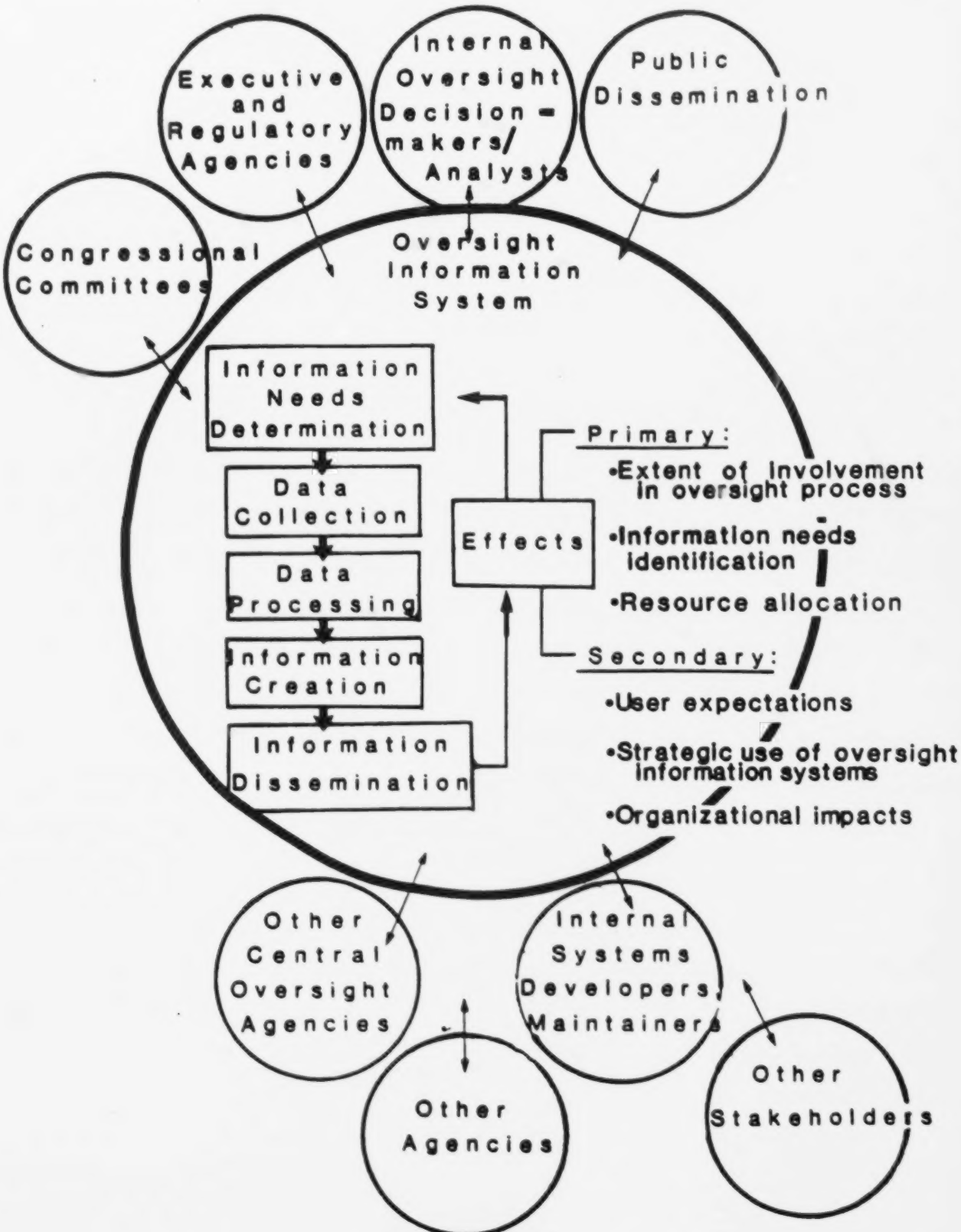


FIGURE 1

oversight. Recent research on the organizational impacts of information technologies also directed our attention to secondary effects of the oversight information systems evidenced in subtle changes in interaction patterns and expectations.[8]

While we hoped to learn what effective oversight agencies look like, defining effectiveness for information systems is necessarily subjective. One factor may be the effects on the user (such as impact on working life quality, task-related transactions, and information as a resource or what will promote positive information system outcomes (full use, increasing productivity and decreasing costs) for the organization. [9]

Specific quality characteristics also help to define effectiveness. These include characteristics such as data completeness, accuracy, and preciseness; output understandability, timeliness, relevance, and meaningfulness; user friendly and error resistant operations; the control of authorized use; and the protection of the system and its operations.[10]

Effectiveness expectations will also vary depending on the information systems function being performed. There are many

different ways to categorize information systems. Transaction systems handle a large volume of transactions with an emphasis on speed, efficiency, and accuracy. They normally are used to aggregate and sort data and are fundamentally different from those designed to support managerial decision-making. In the latter case, responsiveness to semi-structured problems and flexibility is a system hall mark.[11]

If an organization is primarily interested in strategic uses of the information system, then the information system must provide data at several levels: transaction processing, status inquiries, information supporting strategic planning, and policy making by senior management.[12]

Rand's Donald L. Holzman (1978) suggests a conceptual framework that is particularly useful in considering oversight information systems.[13] His framework matches information tasks to four basic information processing types: 1) strategic information (setting policies, choosing objectives, and selecting resources), 2) management information (assuring effectiveness in obtaining and using resources), 3) operational control information (assuring effectiveness in performing operations) and 4) operational performance information (performing the operations). In an oversight system all four processing types are used by an agency in both its internal and external oversight roles.

However, these notions of an effective system seem to imply an organization that is very computer literate and knowledgeable of information resources management applications. It is useful to think of information system use and thus perceived effectiveness as an evolutionary process. An effective system depends on the readiness of the organization to use and expand its capabilities to match the organization's needs. The lowest level of readiness may be characterized by achieving satisfactory control of information - getting the automated "filing" in order. At the other end of the spectrum is knowledge management that supports decision-making in all organizational facets.

Management's challenge in planning, designing, and setting objectives for a system starts with identifying preferred system applications. Once those applications are identified, then the organization needs to build from the current system capability to the preferred state. For example, if managers believe only transactional applications with simple aggregate reporting are needed (as the case with OMB's Grace Commission information), then a simple data collection and reporting system will fill the job. However, if long range strategic planning is the ultimate information system support goal, then a sophisticated analytical system design such as GAO's Planning System or OMB's CBMS is the answer.

Thus effectiveness may be measured by a variety of criteria: effects on the user; positive information system outcomes for the organization; quality characteristics such as data integrity, output, control, the function being performed; and organizational readiness for information system use. In this study the oversight information system users were asked to comment on facets of the systems, as well as facets of organizational context that seem to enhance systems effectiveness.

SYSTEM CAPABILITIES AND USE

The first question researched on system capabilities focuses directly on the interplay between the capabilities and the oversight agency users. In describing how the oversight agency managers use the systems, we draw upon research utilization studies.

Several principles of research utilization could be generalized to explain how technologically supported information is (or is not) utilized. Robert Yin recently synthesized previous work in this field, and described three prevalent utilization patterns.[14] These three conceptualizations can readily characterize OMB's and GAO's experience with oversight information systems. A technology-push theory appears to have credibility for the many decision-makers who have invested resources in providing personal computers for as many managers as possible (like their counterparts in many other federal agencies). Technology-push theory simply hypothesizes that the users will adopt the technology or technologically provided information because the technology is available. As one program manager at GAO explained, effective use of a computerized information system certainly cannot proceed until the managers first learn how to use the keyboards.

Simply providing the system capabilities has the anticipated effect of involving more oversight agency actors with the use and enhancement of the information systems. Interest in the potential of the oversight information systems is undoubtedly heightened by factors such as 1) the appearance of networked terminals and personal computers, 2) the sophisticated printouts that can analyze individual workloads of the oversight staffs at

OMB and GAO, and 3) budgetary and staff resources devoted to the systems within executive branch agencies.

A demand-pull conception of oversight information systems utilization is also apparent when (and only when) upper level political and career managers within the oversight agencies demand more sophisticated analytical capabilities. In other words, key actors in authoritative positions request or demand that technology be adapted to the informational needs they face. This was the case at OMB under David Stockman's leadership. Stockman simply demanded a truly decision-supporting information system, and he got it with the creation of CBMS. His influence upon utilization of information systems at OMB was great, and his departure leads one to question whether or not the resources will continue to be available to support the sophisticated systems designed under his direction.

A social-interaction pattern also helps describe how usage of some of the information systems at GAO and OMB has evolved. Yin points out that utilization may reflect dynamic interactions among users of the information, in which "moving people" is more important then "moving information."[15] Knowledgeable users can contribute greatly by serving as advocates of the systems. And this is indeed the case in the Office of Policy Planning at

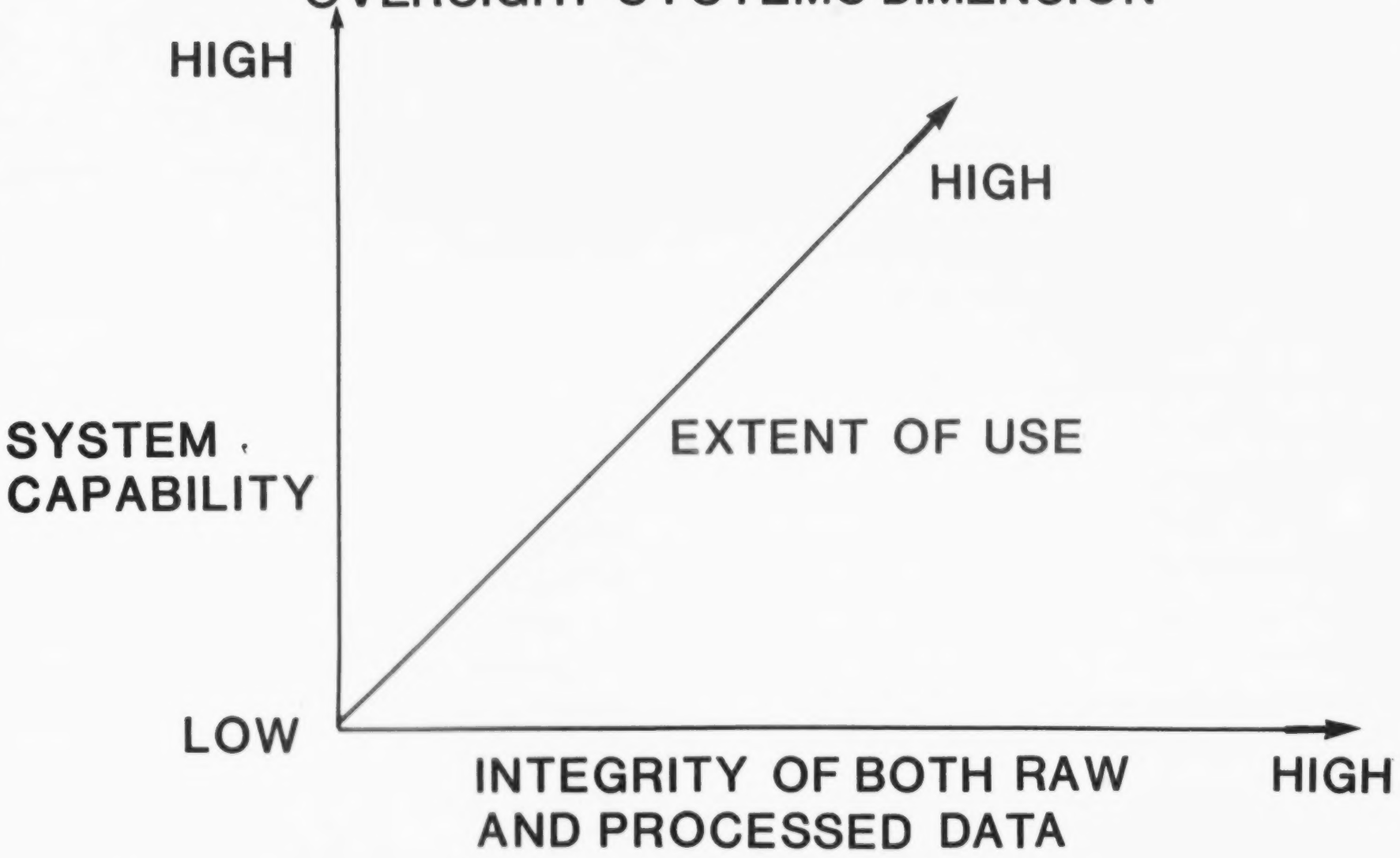
GAO, where career managers backed by political management strive to use the information systems effectively to popularize the strategic planning process within the agency. OMB has a similar objective in attempting to influence appropriations and outlay pattern decision-making by external actors.

Incentives to use the oversight information systems may stem from top-level management support of the systems, or from operational managers' experience with the systems, but in any case, the usefulness of the system will also depend upon its technical capabilities.

FIGURE 2 displays two dimensions that can help explain the institutional development of oversight information systems. These dimensions appear crucial to the successful institutionalization of the systems. They are the perceived integrity of both the raw and processed data and the system capabilities.

As users perceive that the data input into the system are more reliable and valid, more credibility is accorded the outputs. The perceived value of the information provided also depends upon the level of confidence in the integrity, or

FIGURE 2
OVERSIGHT SYSTEMS DIMENSION



believability, of the data provided by the system. And as the systems' technical capabilities increase, the perceived ability of the systems to meet users' needs more effectively and efficiently is enhanced, and the level of use increases.

In short, several different patterns are found in the interaction between the systems and the manager/users within the oversight agencies. These primarily reflect agency differences in top management support (and demand for the decision support systems) and access to the information technologies. The technical capabilities of the systems, increase use of the information systems, but existing predilections shown by upper level management for (or against) the technology may mediate this otherwise almost linear relationship.

USES AND CONSTRAINTS

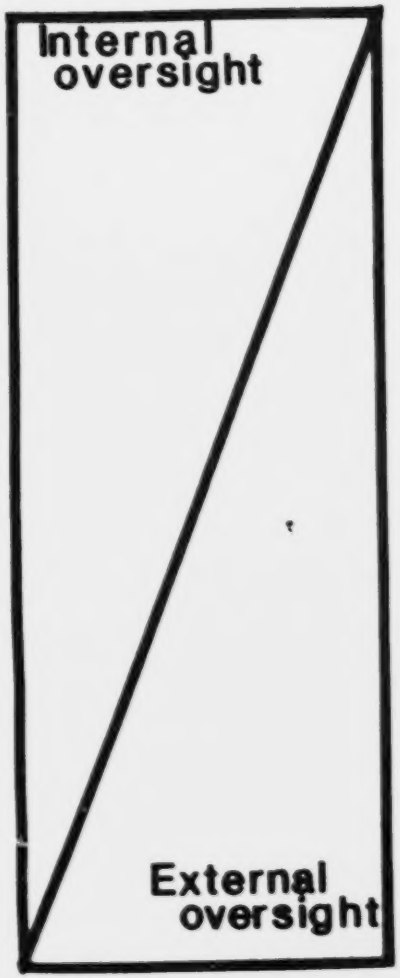
The second research question concerns identification of constraints upon use of the oversight information system by the three primary users -- operational staff, senior managers, and political managers. Typical uses of the GAO and OMB oversight information systems were identified and are displayed graphically in FIGURE

3. Specific uses range from congressional reporting to budgetary justifications for the top political and career officials to performance evaluations and routine tracking at the operational level. Internal oversight purposes are more pervasive at the top, while primary attention is given to external oversight at the operational managerial levels. That is, the information systems provide information useful to top management in overseeing their own agency operations, while they provide information useful to operational managers in exerting their oversight role over other agencies.

As shown, each management level places different information demands on the system, although the constraints identified affect managers at all levels. The striking finding here is the prominent use of the system for internal accountability by upper management. Perhaps the most clear-cut finding of this research is the use of the oversight information systems to demonstrate accountability of the oversight agencies to actors external to these agencies.

The potential constraints touch on many themes such as the inability to meet complex and at times contradictory demands, problems with data coverage and integrity, unusable output, lack of system use incentives, problems with post-installation system development capabilities, and perceived inability to support the oversight agency's external influence.

OVERSIGHT SYSTEMS AND CONSTRAINTS



Management Level	Specific Uses	Potential Constraints
Political	Annual periodic reports to Congress	
	Appropriations justification	Political vulnerability of oversight function
	Testimony press releases	Level of top and senior management priority use
Senior	Political negotiations	Resources available for system enhancement redesign
	Support with Congress and other agencies	
	Internal management reports	Integrity of data input
	Internal budgetary justification	Processing integrity
		Lag between reported and actual status of operations
Operational	Performance evaluations	Proliferation of unfocused analytical reports
	Preparation of priority and planning documents	Lack of match between potentially complementary systems
	Exception follow up	
	Responding to agency management requests	
	Tracking reminders	

FIGURE 3

Inability to meet complex and contradictory demands

The people interviewed believe that the primary purpose of the various oversight systems is to function as an internal and external monitoring and accountability management tool. The oversight information provided allows them to pursue follow-up action, respond to external demands, keep track of existing terms and conditions established either with agencies or agency staff, provide continuity between staff changes, provide information that justifies the central agency's actions, gather information supportive of new policy action, and lastly, provide the means to force oversight down within the organizations being overseen. Such widely divergent information needs press tremendous demands on systems. Systems expected to meet many different functions frequently fail to perform all of them effectively, and complaints about the ability of system reports to meet all of these demands were frequent.

Mismatches between potential complementary systems

Sometimes oversight system data and output complement that of other information systems, within the oversight agency or within other subordinate agencies. These other systems may

collect the same or similar data, but may cover different time periods or have different decision rules operative at intake or processing. Without the necessary networking, staff are forced to spend an extensive amount of time tracking down discrepancies that appeared to be problems, but may be explained by the definitions and time periods used by differing systems. In some cases, staff must resort to manually integrating data because the systems cannot be matched.

Problems with data coverage and integrity

In most cases, system design addressed the various levels of data needs and output analyses. The system is perceived as successful if the data are believed to be complete, accurate and precise. However, many times the missing link is assurance of data coverage and integrity. In some cases critical elements left out of the systems design greatly hindered usefulness of the system. For example, the paperwork collection forms used to input data on information collection requests into the Reporting Management Systems at OMB do not include agency form numbers, only the case number assigned by OMB. Since most system inquiries are based on the agency number, the system cannot be used to address this frequent information need.

Processing integrity problems

Some of the highly analytical oversight systems have results-oriented data input procedures, but the internal processing of data is not subject to editing. Designed to be highly flexible and responsive, these systems do not include the extensive programming controls needed to assure data processing integrity. The most notable example is CBMS. A highly versatile system it was described as a "scratchpad" by its system manager. He said that it was a conscious trade-off to not have data processing integrity, but he believes that while the ability of his staff to spot obvious processing problems keeps the system viable, the risk of error is always there.

Problems with post-installation system development

In several cases, the initial information used to design the oversight information systems do not anticipate future system uses. Physical control of information was anticipated at the design stage, which was particularly important given the volume of data dealt with by OMB and GAO, but as the system became institutionalized, user expectations changed.

Increased volume in information is not the problem. In some cases, the information collected is viewed as useful but is redundant of other information sources. Further, responsive systems support staff can greatly affect the level of oversight support used within the organization, either by program divisions over agencies, or by lower-level managers over staff, through the enhancement of the system to meet user needs. The volume implications were a piece of this performance expectation. With constrained resources, neither oversight agency could afford to collect and try to process and analyze low priority or redundant information.

In the current cut-back environment, oversight staff report that new information collection processes or production of new user reports are not possible. Further, lack of resources means that otherwise successful systems cannot respond to changing demands. As both OMB and GAO staff point out, their work is very difficult, and it changes as the information needs of their agency's political management changes.

Lack of system use incentives

A successful system institutionalizes incentives for rigor in data collection process. Sending subtle messages to agencies or staff that reporting need not be exact or that timeframe can

slip quickly destroys the integrity of data input into the system. For example, OMB's outlay reporting system has a self-correcting mechanism in that errors can be corrected on a later report. If not externally controlled by manual oversight and exception reviews, the system could become completely out of date. The same is true for the GAO recommendations tracking system.

Successful systems also depend on the nature of the staff/agency contact person interface. Shared expectations are needed for system use and data integrity. In the OMB case, the agency staff serving as the contact people tend to be viewed within their agencies as "OMB's flunkies." While it would help if the oversight agency staff could persuade agencies of the value of the oversight systems to the agencies, resources for such marketing are few.

The marketing strategy in place is dependent upon user steering committees or symbolic organizational changes. For example, GAO uses steering committees for the design and redesign of its systems. OMB's successful experience with CBMS hinges in large part on the placement of CBMS support staff near to key users and data providers.

To a great extent, however, visibility of the oversight information system is seen as a means for the oversight agency to control and change the behavior of subordinate agency management. The impact of this visibility is especially important since the central oversight agencies lack overt punitive or reward capabilities.

Proliferation of unfocused analytical reports

Use of a system quite frequently increases users' demands for more and more "cuts" of the data to meet very specific information demands. With the tremendous capability of the systems to produce virtually unlimited aggregated as well as individual level reports, management can quickly become buried in a paper mountain of their own making. In oversight systems, the danger is even greater because of the universe of data elements. Management and supporting staff find that the increased use of the system results in the generation of many interesting reports which do not always provide essential, focused information.

Political vulnerability of the oversight function

An effective oversight system must be visible to those subject to oversight. However, in the case of OMB and GAO,

system visibility is a double-edged sword. The system opens their inner workings to a certain extent to outside groups other than those involved in the oversight process. The nature of this visibility is very important as the oversight agency's main mission is to influence actors external to its inner workings. Kenneth Laudon finds that information about a government organization will affect the organization in several ways:

- it affects the organization's reputation with the public, its primary constituents, its employees, and congressional oversight committees;
- it affects the organization's autonomy -- the more public information there is about the organization's inner workings, the less independent it can be in policy formulation
- the loss of full control over internal information tends to make an organization defensive, perhaps lessening its self-evaluation;
- lastly, increased public information constrains the informal accommodations an organization can make with influential actors outside such as congress, interest groups, and other agencies.[16]

The oversight information systems at OMB are perceived as especially open to political scrutiny. One significant consequence is that decisions are made not to input information regarding specific decisions on regulatory review or information

collection requests, for example, in anticipation of the public's right to obtain such information (e.g. FOIA).

EVOLUTION OF AN EFFECTIVE OVERSIGHT INFORMATION SYSTEM

The third research question focused attention on factors that appear to enhance the evolution of an effective oversight information system. Many note that the ultimate success or failure of the system's use may be determined in the planning stage.[17] As experiences in OMB and GAO point out, not anticipating current operational and future use will limit the utilization of otherwise successful systems. As noted above, effectiveness has been construed as a concept with a variety of possible meanings. System users were asked to identify factors they felt were most essential in enhancing system effectiveness in terms of both positive system outcomes and information quality or integrity. Comments from GAO and OMB staff identified the following factors as important to the evolution of effective systems:

- The oversight information systems <u>should match the agency's culture</u>. In the case of GAO, the cultural message (for one system) was that it is "all right" not to be very concerned with updating system information.

- <u>New management/staff should support or use the system</u>. Without that incentive, the system quickly loses meaning for those who once used it, or thought that it had organizational priority.

- Institutional memory resides in persons, not in the administrative oversight system. With little or no staff turnover, those primarily responsible for the system may not maintain it or even develop it to meet additional needs. They know shortcuts outside of the system framework. Once they leave, the institutional memory leaves, and the deficiencies of the system that is left would quickly become apparent.

- Oversight is needed over Ad hoc complementary systems. Personal computers may be used outside of a distributed network, or manual systems geared to individual needs may become the norm. Similar to the institutional memory problem, these ad hoc systems detract from the overall effectiveness of the oversight information system.

-Lastly, and perhaps most importantly, a system will begin to stagnate and decay if there is no perceived link between system performance and evaluation. Although management may support the system, agencies and staff need to see a connection between their contribution to satisfactory system performance and a reward.

The evolution of the oversight system from physical control to knowledge management is not an easy one. However, it can be measured in terms of the penetration and spread of information technology that is important to managers.[18] Penetration is the degree to which the use of information systems has penetrated an organization in terms of importance and significance in operational decisions (day to day production process), tactical decisions (near term operation) and strategic decision (policy decisions for long-term goals and activities). The more penetration occurs in the organization, the more the organization will use information technology strategically. The increasing sophistication of information technology use indicates growing strategic use.

The spread of information technology throughout the organization can be measured in the extent that information

technology has been decentralized in three ways. One is whether it is supporting more and more functions. Another is in physical equipment terms -- more and more mini-computers and micro-computers or dumb terminals are hooked up. The last is in terms of responsibility as managers take on more control of systems design, development and actual operation.

In both GAO and OMB, oversight information systems are clearly penetrating and spreading. Line managers and staff are taking on the systems work, designing them to match the agency's mission, and more and more applications of information technology to support strategic planning is clearly in their future.

CONCLUSIONS

We explored the relationship between technologically supported oversight information systems and the type and level of political oversight exerted. What we found was that the information these systems provide tends to be used primarily for upward and outward accountability. Information tends not to be used to keep the overseen agencies or individuals in line, but

to support internal agency strategic planning efforts, to report to external actors such as Congress, and to provide performance reports to senior and political managers within the oversight agencies.

The information is used to serve the public, visible side of the central oversight agency, and the less visible strategic planning for internal and external negotiations to meet the agency's mission. The information systems in most cases are very self-serving. They help the agency demonstrate that it is doing what it would like to accomplish, justify current or increased resources, and particularly with OMB, develop data supportive of new policy initiatives. The oversight information systems interestingly enhance internal accountability within the oversight agencies, not within the overseen agencies. In the arena of political oversight, political accountability of the oversight agencies to external audiences is of highest priority to oversight agency managers. They strive to protect their agencies' vulnerability to critics by using the information resources which they gather in a more of a defensive than an offensive manner.

Notes

[1]For example, see Blake Ives, Scott Hamilton, and Gordon Davis, "A Framework for Research in Computer-Based Management Information Systems," Management Science, Vol. 39 (September 1980), pp. 910-934.

[2] Barry Bozeman and Stuart Bretschneider, "Public Management Information Systems, Theory and Prescription," Public Administration Review (Forthcoming).

[3] For example, see Barry M. Rubin, "Design and Implementation of Information Systems for Public Management," Public Administration Review (forthcoming).

[4] See Kathryn Newcomer and Glenn Kamber, "Changing the Rules of Rulemaking," The Bureaucrat, Vol. 11 (Summer 1982), pp. 12-17.

[5]Raymond McLeod Jr., Management Information Systems, 2nd ed., Science Research Associates, Inc., Chicago, 1983, page 15.

[6]Gordon B. Davis and Margrethe H. Olson, Management Information Systems: Conceptual foundations, Structure and Development, 2nd ed., McGraw Hill, New York, 1985, page 6.

Notes

[7]For example see Charles Kafoglis, "A Powerful Tool for Cunning Executives," Data Management, Vol. 23, No. 6, June 1986, 24-27.

[8]Sara Kiesler, "Thinking Ahead: The Hidden Messages in Computer Networks," Harvard Business Review, Vol. 64, No. 1, January-February, 1986, 46-60.

[9]Tora K. Bikson, Electronic Information Systems and User Contexts: Emerging Social Science Issues, Rand/P-6690, September 1981.

[10]Davis and Olson, op cit.

[11]John. C. Camillus and Albert L. Lederer, "Corporate Strategy and The Design of Computerized Information Systems," Sloan Management Review, Vol. 26, No. 3, Spring 1985, 35-42.

[12]Davis and Olson, op cit.

[13]David L. Holzman, A Conceptual Framework of Information Processes: A Means of Improving Bureaucratic Performance, Rand/P-6109, April, 1978.

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[14]Robert Yin and Gwendolyn B. Moore, The Utilization of Research: Lessons from the Natural Hazards Field, Cosmos Corporation, Washington, D.C., January, 1985.

[15]Ibid., page 29.

[16]Kenneth Laudon as referenced in U.S. Congress, Office of Technology Assessment, Automation of America's Offices, U.S. Government Printing Office, OTA-CIT-287, Washington, DC, December, 1985, page 260.

[17]Michael E.D. Koenig, "The Convergence of Computers and Telecommunications: Information Management Implications," Information Management Review, Vol. 1, No. 3, Winter 1986, 23-33.

[18]Cornelius H. Sullivan, Jr., "Systems Planning in the Information Age," Sloan Management Review, Vol. 26, No. 2, Winter 1985, 3-11.